

REMARKS

Applicant appreciates the Examiner's thorough consideration provided the present application. Claims 1, 7, 9, 11, 12, 15, 16, 23-25, 27, 29, 36, 37, 40, 44, 45 and 47-51 are now present in the application. Claims 1 and 29 have been amended. Claims 50 and 51 have been added. Claims 1 and 29 are independent. Reconsideration of this application, as amended, is respectfully requested.

Interview With The Examiner

An interview was conducted with the Examiner in charge of the above-identified application on May 8, 2007. Applicant greatly appreciates the courtesy shown by the Examiner during the interview.

In the interview with the Examiner, Applicant's representative presented arguments with regard to the rejection under 35 U.S.C. § 103(a). Specifically, it was argued that the position signals are not provided by Reber's processor (referred to by the Examiner as the scanning control means) nor stored in Reber's memory (referred to by the Examiner as the storage means), that there is no motivation to modify Reber in view of Gordon because Reber does not provide the position signals, that Virtanen only applies to imaging of tagged cells, and that Ekins is related to the field of view, not the spot diameter of 112 μ m. However, no agreement was reached.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 7-9 11, 12, 14, 23-25, 27, 29, 36, 37, 40, 44, 45 and 47-49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reber, U.S. Patent No. 6,110,748, in view of Gordon, U.S. Patent No. 5,892,577, Ekins, Clinical Chemistry, Vol. 37, no 11, pp. 1955-1967, and Virtanen, U.S. Patent No. 6,342,349. Claims 15 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reber in view of Gordon, Ekins and Virtanen. These rejections are respectfully traversed.

In light of the foregoing amendments, Applicant respectfully submits that these rejections have been obviated and/or rendered moot. As the Examiner will note, independent claims 1 and 29 have been amended.

Independent claim 1 now recites “[a]n apparatus for identifying a position of marked objects having unknown positions and detecting a property of the marked objects contained in a specimen, the apparatus comprising a frame, a member positioned on the frame and having a surface that is adapted to receive and hold the specimen, at least a first light source for emitting at least a first light beam towards the specimen held by the member, wherein the first light beam is adapted to provide a light spot having a diameter between 20-150μm on the specimen, at least a detector for detecting a light emitted from the marked objects upon interaction with the first light beam, the first light source and the detector being arranged so that a part of a light beam path from the first light source to the specimen is co-axial with a part of the light emitted from the marked objects, scanning means for scanning the entire surface of the member in relation to the detector along a non-linear curve, wherein the scanning means comprises means for rotating the member and means for displacing the member along a radius of the rotation of the member,

so as to identify the position of the marked objects in the entire specimen and detect the property of the marked objects, the means for rotating and the means for displacing being directly connected to the member, the member being rotatable and displaceable along a radius of the rotation of the member, scanning control means for controlling the scanning means for scanning the specimen along the non-linear curve, storage means for storing detector signals relating to the marked objects provided by the detector and corresponding position signals provided by the scanning control means, means for retrieving the position signals stored in the storage means, and a microscope for viewing images of the marked objects, wherein the scanning control means using the retrieved position signals to place the microscope at the position of the marked objects to allow performing a detailed examination of the marked objects.”

Independent claim 29 now recites “[a] method of identifying a position of an object having an unknown position and detecting a property of the object contained in a specimen and comprising the steps of: positioning the specimen on a member having a surface that is adapted to receive and hold the specimen, emitting at least a first light beam from a first light source towards the specimen held by the member, wherein the first light beam is adapted to provide a light spot having a diameter between 20-150 μ m on the specimen, scanning the entire surface of the member in relation to a detector along a non-linear curve by rotating the member holding the specimen and displacing the member along a radius of the rotation of the member, the member being rotatable and displaceable along a radius of the rotation of the member, arranging the light source and the detector, so that a part of a light beam path from the first light source to the specimen is co-axial with a part of a light emitted from the object, detecting the light emitted from the object, thereby identifying the position of the object and detecting the property of the

object during scanning of the entire specimen, storing detector signals relating to the object provided by the detector and corresponding position signals provided by the scanning control means, retrieving the position signals stored in the storage means, placing a microscope at the position of the object using the retrieved the position signals to allow performing a detailed examination of the object, and optically inspecting the object by viewing an image of the object via the microscope by a user.”

Support for the amendments to claims 1 and 29 can be found on page 1, lines 5-7, page 2, lines 18-20, page 15, lines 32-33, page 6, lines 8-9 (for “unknown positions”), and on page 16, lines 31-34 (for “scanning the entire surface of the member”). The claimed invention relates to the location of marked objects having unknown positions until scanning has been performed, and that the entire surface of the member is scanned and that the entire specimen is scanned in search for marked objects. In particular, the present invention discloses that the position of the marked object is determined or the marked object is located. Since the position of the marked object is not known until the position is determined or the object is located then the marked objects have unknown positions until the positions are determined or identified during scanning.

Applicant respectfully submits that the above combinations of elements and steps as set forth in amended independent claims 1 and 29 are not disclosed nor suggested by the references relied on by the Examiner.

Present Invention

The present invention relates to a detection of marked objects in a sample, wherein the position of a marked object is unknown until detected during the scanning steps. When a marked

object is detected the scanning control means provides information of the position to the storage means, and the detector provides information of the marked object. The amended claims recite scanning means/steps for scanning the entire surface of the member, and that the entire specimen is scanned in order to identify the position of any marked objects.

Since the position information is stored, it is at a later stage possible to arrange a microscope, using the same scanning control means to position the microscope, at the position of each identified marked object. Therefore, the present invention relates to first detection of the position of marked objects and in a later step a more detailed examination of the marked object through a microscope.

The prior art documents relied upon by the Examiner relate to a completely different principle in that they all relate to detection of events taking place at predetermined positions (i.e., known positions), wherein the only task is to step from one known position to the next known position in order to detect whether an event has taken place at said known position, a principle called Lab-on-a disc.

Reber

1. Reber does not explicitly nor inherently disclose that scanning control means provides address information to be stored in memory.

The Examiner has persistently stated that Reber includes the feature that the position information is provided by the scanning control means to the storage means as recited in claims 1 and 29. However, since no explicit disclosure is made in Reber, the Examiner has to make his allegation based on the assumption that the feature is inherently presented in Reber.

Under the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element “is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” *Cont’l Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). “Inherent anticipation requires that the missing descriptive material is ‘necessarily present,’ not merely probably or possibly present, in the prior art.” *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295, 63 USPQ2d 1597, 1599 (Fed. Cir. 2002) (quoting *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

Here, Reber discloses systems and methods for performing assays with distinct binding sites arranged either in a circular grid or lattice, or in a spiral grid or lattice on a disk-shaped member. For each distinct binding site a machine-readable data is arranged. A positioning mechanism positions the disk-shaped member with respect to a data reader and a detector. FIG. 1 shows the principle behind the disclosure in Reber.

From FIG. 1 of Reber, it is clear that the processor 36 (referred to by the Examiner as the scanning control means) directs the positioning devices controlling the detector and the data reader to the relevant positions. However, as shown in FIG. 1 of Reber, it is also clear that the only information provided to the memory from the processor is information from the detector, i.e., whether a binding event has happened on a receptor, and from the data reader, i.e., the machine-readable data connected to the receptor. No positioning information is returned from the processor to the memory. Therefore, Reber fails to explicitly teach “storage means for storing ... corresponding position signals provided by the scanning control means” as set forth in claim

1 and “storing ... corresponding position signals provided by the scanning control means” as recited in claim 29.

Furthermore, in Reber, it is also unnecessary to return any positioning information from the processor to the memory because the binding site and the machine-readable data were pre-arranged prior to detection (i.e., known positions), and the information necessary to identify the identity of the binding site is the information provided by the machine-readable data. Since it is unnecessary to store the position signals because the positions of the binding sites are known prior to detection, the features “storage means for storing ... corresponding position signals provided by the scanning control means” as set forth in claim 1 and “storing ... corresponding position signals provided by the scanning control means” as recited in claim 29 are not necessarily presented in Reber. Therefore, Reber also fails to inherently teach the above recitations as set forth in claims 1 and 29.

Since the recitations “storage means for storing ... corresponding position signals provided by the scanning control means” as set forth in claim 1 and “storing ... corresponding position signals provided by the scanning control means” as recited in claim 29 are not explicitly nor inherently disclosed in Reber, Reber fails to teach the above recitations as set forth in claims 1 and 29.

In addition, although Gordon discloses the address information in the disc, there is no motivation to modify Reber in view of Gordon because in Reber the positions of the sites are already known prior to detection. Therefore, there is no need to store Gordon’s address information in Reber’s memory because the known positions of the sites have been already in the Reber’s memory prior to detection.

2. Reber fails to identify the unknown position of the marked objects.

In addition, since the binding site and the machine-readable data were pre-arranged prior to detection (i.e., known positions), Reber also fails to teach “the scanning means ... so as to identify the [unknown] position of the marked objects in the entire specimen and detect the property of the marked objects” as recited in claim 1, and “identifying the [unknown] position of the object and detecting the property of the object during scanning of the entire specimen” as recited in claim 29.

3. Reber fails to scan the entire surface of the member.

Furthermore, Reber also fails to teach “scanning means for scanning the entire surface of the member” as recited in claim 1 and “scanning the entire surface of the member” as recited in claim 29. In particular, as mentioned above, Reber’s detector jumps from one site in a known position to another site in another known position in the device 20 (referred to by the Examiner as the member of the claimed invention). Although the sites are located in the device 20, they simply occupy a partial portion of the device 20, not the entire surface of the device 20. Since Reber’s detector simply jumps from one site in a known position to another site in another known position in the device 20, Reber’s detector does not scan the entire surface of the device 20, but simply detect the sites in the specific known positions. Therefore, Reber fails to teach “scanning means for scanning the entire surface of the member” as recited in claim 1 and “scanning the entire surface of the member” as recited in claim 29.

Ekins – Ekins does not disclose a spot diameter

Ekins discloses detection of analytes by arranging spots of catching antibodies on a solid support and adjusting the field of view of the detector to the size of the spot of antibodies. Ekins does not explicitly nor inherently disclose that the light spot diameter correspond to the field of view. Therefore, Ekins does not disclose “the first light beam is adapted to provide a light spot having a diameter between 20-150 μ m on the specimen” of claims 1 and 29.

Virtanen – Virtanen requires labelling of cells to use the optical disc reader as a scanning confocal microscope

Virtanen describes in col. 47-50 how optical disc readers may function as confocal microscopes. Virtanen in col. 50, lines 1-3 discloses:

“By labeling the surface of cells relatively uniformly, their individual sizes and shapes can be measured by the optical disk drive function as a scanning confocal microscope.”

Thus, in order to use the optical disc reader as a scanning confocal microscope, it is necessary to label the cells, since the only signal received by the optical disc reader is the signals from the labels.

When evaluating obviousness the claimed invention must be considered as a whole, not just individual elements or steps must be considered. It is not allowable to consider a subcombination of the references for one part of a claim and another subcombination of references for another part of the claim, if the combined references in total cannot be combined to provide the claimed invention when two of the references teach away from each other. When the proposed combination of the prior art would change the principle of operation of the prior art

invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Here, the combination of Ekins and Virtanen contradicts each other, and cannot be combined without change of principle of one of them. In particular, the combination of Reber in view of Gordon, Virtanen and Ekins leads to an apparatus and a method wherein the optical disk reader of Virtanen cannot function as a scanning confocal microscope with respect to the cells and bacteria described in Virtanen, because the field of view in Ekins being at the smallest 112 μm , is much larger than the size of bacteria (being about 2-4 μm) and cells (being about 5-15 μm). Accordingly, one skilled in the art will not combine Reber and Ekins, and then further combine with Gordon and Virtanen.

Accordingly, none of those references individually or in combination teach or suggest the limitations of amended independent claims 1 and 29. Therefore, Applicant respectfully submits that claims 1 and 29 and their dependent claims clearly define over the teachings of the references relied on by the Examiner.

In addition, dependent claims 15 and 16 relate to the area of the specimen being arranged on the disk, not the area of the disk as such. Thus, the question is not whether the disks of Reber, Gordon, Ekins or Virtanen has a size of a conventional CD-ROM, but whether the specimen applied in Reber, Gordon, Ekins or Virtanen covers the claimed area during scanning.

Reber teaches that the molecular receptors are arranged in a circular or spiral grid or lattice (see col. 2, lines 18-21). The drawings show how the arrangement of the molecular receptors is made. It is clear from the drawings that only a minor fraction of the disk surface

area is taken up by the receptors and thereby also by the specimens added to the disk surface during detection.

Gordon shows in FIG. 1 that the enzyme-conjugated antibodies 5 are arranged as distinct spots on the disk, covering only a fraction of the disk.

Ekins shows in FIG. 8 that only a minority of the antibody spots has reacted with sample, whereby the sample covers only a tiny fraction of the disk surface.

Virtanen, similar to Reber, shows that the specimen is arranged as distinct spots or lines, covering only a fraction of the surface of the disk.

Accordingly, none of the references Reber, Gordon, Ekins and Virtanen disclose an apparatus or method wherein the specimen has a larger area than 500 mm^2 , let alone an area larger than 8000 mm^2 during scanning of the specimen.

Furthermore, it is not obvious to increase the area of specimen in any of the references, since the teaching of the references need distinct specimens in order to function. Therefore, claims 15 and 16 are non-obvious in view of the combined references.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

Additional Claims

Additional claims 50 and 51 have been added for the Examiner's consideration. Applicant respectfully submits that claims 50 and 51 are allowable due to their respective dependence on independent claim 29, as well as due to the same reasons for claims 15 and 16 as

mentioned above. Favorable consideration and allowance of additional claims 50 and 51 are respectfully requested.

CONCLUSION

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Joe McKinney Muncy, Registration No. 32,334 at (703) 205-8000 in the Washington, D.C. area to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicants respectfully petition for a one (1) month extension of time for filing a response in connection with the present application and the required fee is attached herewith.

Application No. 09/806,457
Amendment dated June 1, 2007
Reply to Office Action of March 2, 2007

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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